

WHAT IS CLAIMED IS:

1 1. An apparatus for attaching a thermal solution to a circuit board comprising:
2 a mounting plate having a mounting plate opening designed to allow the thermal
3 solution to contact a processor, the processor located on the circuit board; and
4 a connector having a first end and a second end, the first end attachable to the
5 mounting plate and the second end securable to the circuit board, the connector designed
6 to keep the mounting plate in contact with the processor.

1 2. The apparatus of claim 1 further comprising a backing plate connected to the
2 mounting plate with the connector, wherein the second end of the connector is securable
3 to the backing plate, the backing plate designed to prevent flexure of the circuit board.

1 3. The apparatus of claim 2 wherein the connector is a locking pin designed to slide
2 through an existing tooling hole in the circuit board and securable at its first end to a slot
3 in the mounting plate.

1 4. The apparatus of claim 3 comprising four key-hole shaped slots in the mounting
2 plate and four corresponding locking pins insertable therein, each slot having a shelf
3 along which the locking pin can slide.

1 5. The apparatus of claim 4 wherein each shelf is substantially horizontal or
2 substantially angled.

1 6. The apparatus of claim 5 wherein the locking pins have bosses sizeable along the
2 shelves.

1 7. The apparatus of claim 6 wherein the shelves are substantially horizontal and the
2 thermal solution has a threaded base engageable with threads in the mounting plate
3 opening.

1 8. The apparatus of claim 7 wherein pressure on the processor increases as the
2 thermal solution is screwed into the mounting plate opening, further wherein thermal
3 resistance between the processor and thermal solution is reduced.

1 9. The apparatus of claim 8 further comprising a torque driver to screw the thermal
2 solution into the mounting plate opening, wherein a predetermined amount of pressure
3 can be imparted to the processor.

1 10. The apparatus of claim 9 wherein about 345 to 690 kPa of pressure is imparted to
2 the processor after the thermal solution has been screwed into the mounting plate
3 opening.

1 11. The apparatus of claim 6 wherein the shelves are substantially angled and the
2 thermal solution is hard-mounted to the mounting plate opening.

1 12. The apparatus of claim 11 wherein pressure on the processor increases as the
2 locking pins slide along the shelves in a downwardly direction.

1 13. The apparatus of claim 12 wherein about 345 to 690 kPa of pressure is imparted
2 to the processor after the locking pins have been slid along the shelves.

1 14. The apparatus of claim 2 wherein the apparatus attaches the thermal solution to
2 the circuit board temporarily during testing.

1 15. The apparatus of claim 14 wherein the circuit board is less than 1.5 mm in thickness
2 and 30 watts of power is removable by the thermal solution near a temperature of about
3 100°C.

1 16. The apparatus of claim 14 wherein the circuit board is greater than 1.5 mm in
2 thickness and about 50 or more watts of power is removable by the thermal solution near
3 a temperature of about 100°C.

1 17. The apparatus of claim 16 wherein the apparatus permanently attaches the thermal
2 solution to the circuit board.

1 18. The apparatus of claim 2 wherein the mounting plate, backing plate and connector
2 are each made from a material selected from the group consisting of aluminum, steel and
3 plastic.

1 19. A removable thermal solution attachment mechanism comprising:
2 a mounting plate designed to mount a thermal solution to a package;
3 a backing plate designed to connect to the mounting plate; and
4 connectors insertable into the mounting plate and backing plate wherein the
5 thermal solution can impart a force on the package when the thermal solution is secured
6 to the mounting plate, further wherein the thermal solution can remove heat from a
7 processor located in the package.

1 20. The mechanism of claim 19 wherein the thermal solution is an active or passive
2 thermal solution.

1 21. The mechanism of claim 19 wherein the connectors are locking pins having one
2 or more bosses insertable into openings in the mounting plate.

1 22. The mechanism of claim 19 wherein the mounting plate has slots having a
2 substantially horizontal or angular shelf along which the bosses can slide.

1 23. The mechanism of claim 19 wherein the package is a socketed package securable
2 to a circuit board.

1 24. The mechanism of claim 19 wherein the backing plate and connectors are bench
2 top fixtures.

1 25. A method for attaching a thermal solution to a circuit board comprising:
2 placing a mounting plate on top of a circuit board;
3 aligning slots on the mounting plate with locking pins securable to the circuit
4 board;
5 inserting one end of each locking pin into each mounting plate slot;
6 sliding each locking pin along a shelf located in each mounting plate slot; and
7 securing a thermal solution to the mounting plate wherein pressure is applied to a
8 package located beneath the thermal solution.

1 26. The method of claim 25 further comprising providing a backing plate designed to
2 give support to the circuit board, the locking pins securable to the backing plate.

1 27. The method of claim 26 further comprising:
2 testing the circuit board;
3 removing the attachment mechanism from the circuit board; and
4 reusing the attachment mechanism with another circuit board.

1 28. The method of claim 25 further comprising using the circuit board in normal
2 operation, wherein the attachment mechanism permanently attaches the thermal solution
to the circuit board.

1 29. A method for temporarily attaching a thermal solution to a circuit board
2 comprising:
3 providing a thermal solution attachment mechanism having first and second plates
4 and a set of connectors to connect the first and second plates together;
5 placing a circuit board between the first and second plates wherein a thermal
6 solution secured to the first plate contacts a package located on the circuit board;
7 testing the circuit board, wherein heat is removed by the thermal solution from a
8 processor located in the package; and
9 removing the thermal solution attachment mechanism from the circuit board.

1 30. The method of claim 29 further comprising reusing the thermal solution
2 attachment mechanism on another circuit board.

1 31. The method of claim 29 further comprising:
2 inserting the connectors into slots in the first plate; and
3 sliding the connectors along shelves located in the slots wherein the first and
4 second plates are connected.

1 32. The method of claim 30 wherein the shelves are substantially horizontal or
2 angled.

1 33. The method of claim 32 further comprising applying pressure to the processor.